

$$\frac{\text{kg m}}{\text{s}^2} = \text{kg}$$

Summation of forces

- IF \vec{F}_{net} or $\sum \vec{F} = 0$, then all forces on the object / system cancel out.

• IF there is no net force, it doesn't mean the object is not moving, just that it is not accelerating.

★ 1st Law = statement of inertia. ★

Inertia is the natural tendency for an object to resist a change in its motion (specifically a change in its velocity.)

• mass is a quantitative measure of inertia.

• more mass = more inertia.

• good example of inertia in a car seat belt on page 99.

2nd Law: When an external net force, $F_{\text{net}} = \sum F$, acts on an object of mass "M", the acceleration \vec{a} is directly proportional to the net force.

$$\vec{a} = \frac{\sum \vec{F}}{M} \quad (\text{if } \vec{F}_{\text{net}} \text{ doubles, } \vec{a} \text{ doubles})$$

\vec{a} is ^{inversely} ~~indirectly~~ proportional to M.

$\sum \vec{F} = m \cdot \vec{a}$ \vec{a} is in the same direction as the net force.